

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A system that performs supplemental frequency domain training of a time domain equalizer comprising:  
  
a training module that uses an initial solution for time domain equalizer coefficients and determines updated time domain equalizer coefficients by maximizing ~~the~~ a number of bits per frame; and  
  
a time domain equalizer that receives the updated time domain equalizer coefficients.
2. (Previously Presented) The system of claim 1, wherein the supplemental training is performed during medley.
3. (Previously Presented) The system of claim 1, wherein the updated time domain equalizer coefficients are used during showtime.
4. (Previously Presented) The system of claim 1, wherein the training module receives a data matrix from an echo canceller.

5. (Previously Presented) The system of claim 1, wherein additional training is performed based on the updated time domain equalizer coefficients.

6. (Previously Presented) The system of claim 5, wherein the additional training comprises frequency domain equalizer training and signal to noise ratio measurements for bit loading.

7. (Currently Amended) ~~The system of claim 1,~~ A system that performs supplemental frequency domain training of a time domain equalizer comprising:  
a training module that uses an initial solution for time domain equalizer coefficients and determines updated time domain equalizer coefficients by maximizing the number of bits per frame; and  
a time domain equalizer that receives the updated time domain equalizer coefficients, wherein the system is located in one or more of a DSL, VDSL, SDSL, HDSL, HDSL2, discrete multi-tone, discrete wavelet multi-tone DSL or wireless OFDM system.

8. (Previously Presented) The system of claim 1, wherein the training module further determines a mean squared signal value for each bin, for the given time domain equalizer coefficients.

9. (Previously Presented) The system of claim 1, wherein the training module further determines an average error squared value over a predetermined number of frames for each bin.

10. (Previously Presented) The system of claim 1, further comprising using the updated time domain equalizer coefficients as the initial solution for time domain equalizer coefficients.

11. (Currently Amended) A method that performs supplemental frequency domain training of ~~the~~ a time domain equalizer comprising:

receiving a ~~solution of~~ initial time domain equalizer coefficients;

determining updated time domain equalizer coefficients by maximizing ~~the~~ a number of bits per frame; and

forwarding the updated time domain equalizer coefficients to a time domain equalizer.

12. (Previously Presented) The method of claim 11, wherein the supplemental training is commenced during medley.

13. (Previously Presented) The method of claim 11, further comprising determining a mean squared signal value for each bin, for the given time domain equalizer coefficients.

14. (Previously Presented) The method of claim 11, further comprising determining the average error squared value over a predetermined number of frames for each bin.

15. (Previously Presented) The method of claim 11, further comprising repeating the determining step using the updated time domain equalizer coefficients as the initial time domain equalizer coefficients.

16. (Previously Presented) The method of claim 11, further comprising estimating a channel frequency response.

17. (Previously Presented) The method of claim 11, wherein the updated time domain equalizer coefficients are used during showtime.

18. (Currently Amended) ~~The method of claim 11,~~ A method that performs supplemental frequency domain training of a time domain equalizer comprising:  
receiving initial time domain equalizer coefficients;  
determining updated time domain equalizer coefficients by maximizing the  
number of bits per frame; and  
forwarding the updated time domain equalizer coefficients to a time domain  
equalizer, wherein the method is performed in one or more of a DSL, VDSL, SDSL, HDSL, HDSL2, discrete multi-tone, discrete wavelet multi-tone DSL or wireless OFDM system.

19. (Previously Presented) The method of claim 11, further comprising receiving a data matrix.

20. (Previously Presented) The method of claim 11, further comprising performing additional training is performed based on the updated time domain equalizer coefficients.

21. (Currently Amended) An information storage media comprising information that performs supplemental frequency domain training of ~~the~~ a time domain equalizer comprising:

information that receives ~~a solution of~~ initial time domain equalizer coefficients;  
information that determines updated time domain equalizer coefficients by maximizing the number of bits per frame; and

information that forwards the updated time domain equalizer coefficients to a time domain equalizer.

22. (Previously Presented) The information storage media of claim 21, wherein the supplemental training is commenced during medley.

23. (Previously Presented) The information storage media of claim 21, further comprising information that determines a mean squared signal value for each bin, for the given time domain equalizer coefficients.

24. (Previously Presented) The information storage media of claim 21, further comprising information that determines the average error squared value over a predetermined number of frames for each bin.

25. (Previously Presented) The information storage media of claim 21, further comprising information that repeats the determining step using the updated time domain equalizer coefficients as the initial time domain equalizer coefficients.

26. (Previously Presented) The information storage media of claim 21, further comprising information that estimates a channel frequency response.

27. (Previously Presented) The information storage media of claim 21, wherein the updated time domain equalizer coefficients are used during showtime.

28. (Previously Presented) The information storage media of claim 21, wherein the method is performed in one or more of a DSL, VDSL, SDSL, HDSL, HDSL2, discrete multi-tone, discrete wavelet multi-tone DSL or wireless OFDM system.

29. (Previously Presented) The information storage media of claim 21, further comprising information that receives a data matrix.

30. (Previously Presented) The information storage media of claim 21, further comprising information that performs additional training based on the updated time domain equalizer coefficients.